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IS 381 (1995): Sodium silicate - Specification [CHD 1: Inorganic Chemicals]



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IS 381 : 1995

(Reaffirmed 1999)

भारतीय मानक

सोडियम सिलिकेट — विशिष्ट

(दूसरा पुनरीक्षण)

Indian Standard

SODIUM SILICATE— SPECIFICATION

(*Second Revision*)

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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Price Group 3

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the General Inorganic Chemicals Sectional Committee had been approved by the Chemical Division Council.

This standard was originally published in 1952 and revised in 1972, incorporating requirements of sodium silicate for use in textile, soap, cement, adhesives, and pharmaceutical industries. In the present version, additional requirements of chloride and sulphate contents have been incorporated for neutral sodium silicate in liquid form, suitable for use in pharmaceutical and toilet preparations. The methods of test for all the requirements have been modified which are now being covered in IS 14212 : 1995.

Sodium silicates of certain ratios are also used for application to concrete floors to harden them, for preserving eggs, for making dustless concrete floors and for protecting pervious building materials against the effects of moisture.

The composition of the committee responsible for the formulation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

SODIUM SILICATE—SPECIFICATION

(Second Revision)

1 SCOPE

1.1 This standard prescribes requirements and method of sampling for sodium silicate, in solid and liquid forms, for use in various industries.

2 REFERENCES

2.1 The following Indian Standards are necessary adjunct to this standard:

IS No.	Title
4905 : 1968	Methods for random sampling
14212 : 1995	Methods of test for sodium and potassium silicates

3 GRADES

3.1 Both the solid as well as the liquid forms of sodium silicate shall be of the following two grades:

- a) Neutral, and
- b) Alkaline.

4 TYPES

4.1 Liquid, neutral sodium silicate shall be of the following two types:

- a) *Type 1* For use in pharmaceutical and toilet preparations, and
- b) *Type 2* For use as adhesive and other purposes.

4.2 Liquid, alkaline sodium silicate shall be of the following three types:

- a) *Type 1* } For use in soap, detergent,
- b) *Type 2* } textile, welding electrode and
- c) *Type 3* } cement industries.

5 REQUIREMENTS

5.1 Description

The material shall be clear, free from dirt and other visible impurities.

5.1.1 Sodium silicate, liquid shall be thick, viscid, translucent mass of water, white or slightly grey colour.

5.1.2 Sodium silicate, solid shall be in the form of glassy lumps of pale grey or green colour.

To meet the special requirements, the particle size shall be as agreed to between the purchaser and the supplier.

5.2 The material shall also comply with the requirements given in Table 1 when tested according to the methods prescribed in IS 14212 : 1995. Reference to the relevant clauses of IS 14212 : 1995 is given in col 10 of Table 1.

6 PACKING AND MARKING

6.1 Packing

The material shall be packed in air-tight mild steel drums of capacity as agreed to between the purchaser and the supplier.

6.2 Marking

Each package shall be legibly and indelibly marked with the following information:

- a) Name and grade of the material,
- b) Indication of the source of manufacture,
- c) Gross and net mass of the material,
- d) Year of manufacture, and
- e) Lot number to enable the batch of manufacture to be traced from the records.

6.2.1 BIS Certification Marking

The packages may also be marked with the Standard Mark.

6.2.1.1 The use of the Standard Mark is governed by the provisions of Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

7 SAMPLING

7.1 The method of drawing representative samples of the material, number of tests to be performed and the method of determining the criteria of conformity of the material to the requirements of this specification shall be as prescribed in Annex A.

Table 1 Requirements for Sodium Silicate

(Clause 5.2)

Sl No.	Characteristic	Requirements for							Method of Test [Ref to Cl in IS 14212 : 1995]
		Liquid					Solid		
		Neutral		Alkaline			Neutral	Alkaline	
		Type 1	Type 2	Type 1	Type 2	Type 3			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
i)	Matter insoluble in water, percent by mass, <i>Max</i>	0.1	0.2	0.2	0.2	0.2	4.0	1.5	A-3
ii)	Relative density at 27/27°C	1.39 - 1.41	1.39 - 1.41	1.69 - 1.71	1.54 - 1.56	1.34 - 1.36	—	—	A-5
iii)	Total soluble silicates, percent by mass, <i>Min</i>	38	38	54	48	30	95	98	A-7 or A-12
iv)	Ratio of total alkalinity (as Na ₂ O) to total soluble silica (as SiO ₂) (Na ₂ O : SiO ₂)	1:3.2 ± 0.1	1:3.2 ± 0.1	1:2.0 ± 0.1	1:2.0 ± 0.1	1:2.0 ± 0.1	1:3.2 ± 0.1	1:2.0 ± 0.1	A-9
v)	Loss in mass on ignition, percent by mass, <i>Max</i>	—	—	—	—	—	1.0	0.5	A-10
vi)	Iron as (Fe), percent by mass, <i>Max</i>	0.005	0.02	0.02	0.02	0.02	0.04	0.04	A-11
vii)	Viscosity at 20°C	200 - 500	—	—	—	—	—	—	A-12
viii)	Chloride (as NaCl), percent by mass, <i>Max</i>	0.25	—	—	—	—	—	—	A-14
ix)	Sulphate (as Na ₂ SO ₄), percent by mass, <i>Max</i>	0.2	—	—	—	—	—	—	A-15

ANNEX A

(Clause 7.1)

METHOD OF SAMPLING OF SODIUM SILICATE

A-1 GENERAL REQUIREMENTS

A-1.0 In drawing, preparing, storing and handling samples, the following precautions and directions shall be observed.

A-1.1 Precautions shall be taken to protect the samples, sampling instruments and the containers for samples from contamination.

A-1.2 The material shall be thoroughly mixed before drawing the sample.

A-1.3 The samples shall be placed in suitable, clean and dry containers with proper closures.

A-1.4 Each sample container, after filling, shall be sealed air-tight and marked with full details of sampling.

A-2 SCALE OF SAMPLING

A-2.1 Lot

All the containers in a single consignment of the material of one grade drawn from a single batch of manufacture shall constitute a lot. If a consignment is declared or known to consist of different grades or batches or manufacture, the containers shall be suitably separated and grouped to form lots as defined above.

A-2.1.1 Samples shall be tested from each lot for ascertaining conformity of the material to the requirements of the specification.

A-2.2 The number (n) of containers to be chosen from a lot shall depend on the size of the lot (N) and shall be in accordance with col 1 and 2 of Table 2.

A-2.3 The drums to be selected for sampling shall be chosen at random, preferably with the aid of random number tables. In order to ensure randomness of selection, the procedure given in IS 4905 : 1968 may be followed.

Table 2 Number of Drums to be Selected
(Clause A-2.2)

Lot Size	Number of Drums to be Selected
N	n
(1)	(2)
Up to 10	3
11 „ 20	5
21 „ 30	7
31 „ 50	10
51 and above	15

A-3 TEST SAMPLES AND REFEREE SAMPLES

A-3.1 Preparation of Test Samples

A-3.1.1 Draw with an appropriate sampling instrument a small portion of sodium silicate (solid) from different parts of each drum selected for sampling according to A-2, after mixing thoroughly the contents of the drum and then allowing the liquid to come to rest. The total quantity of the material drawn from each selected drum shall be approximately 500 g. In the case of liquid, the sample weighing approximately 300 g shall be withdrawn after mixing the content of the drum thoroughly and allowing the liquid to come to rest.

A-3.1.2 Transfer the portions collected from each drum to separate sample containers. These filled containers are termed as individual samples.

A-3.1.3 Out of each individual samples, a small but equal quantity shall be taken out and mixed up together thoroughly so as to form a composite sample, weighing about 300 g. In case sieving is necessary, the portions from individual sample shall be sieved separately and the composite sample shall be prepared only out of the sieved material. This composite sample shall be divided into three equal parts, one for the purchaser, another for the supplier and the third to be used as referee sample.

A-3.2 Referee Sample

The referee sample shall consist of the composite sample (see A-3.1.3) and a set of individual test samples (see A-3.1.2) marked for this purpose and shall bear the seals of the purchaser and the supplier. These shall be kept at a place agreed to between the purchaser and the supplier and shall be used in the case of dispute between the two.

A-4 NUMBER OF TESTS

A-4.1 Tests for total soluble silicates and the ratio for total alkalinity to total soluble silica shall be carried out on any three individual samples, selected at random out of those prepared according to A-3.1.2. The same samples shall be used for both the tests.

A-4.2 Tests for all other characteristics shall be carried out on the composite sample.

A-5 CRITERIA FOR CONFORMITY

A-5.1 For those characteristics which have been tested on the individual test sample (see A-4.1), all the test results on each of the individual samples shall satisfy the corresponding requirements given in Table 1, if the lot is to be deemed to conform to those requirements.

A-5.2 For the remaining characteristics prescribed in Table 1, the test results on the composite sample shall meet the corresponding specified requirements.

A-5.3 The lot shall be declared as conforming to the requirements of the specification if A-5.1 and A-5.2 are satisfied.

ANNEX B

(Foreword)

COMMITTEE COMPOSITION

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